Lobachevskii Journal of Mathematics 2016 vol.37 N6, pages 787-793

Analysis of finite elasto-plastic strains. Medium kinematics and constitutive equations

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Abstract

© 2016, Pleiades Publishing, Ltd.The paper puts forwards principal kinematic relations and constitutive equations, which can be applied in designing numerical methods of study of finite elasto-plastic strains. The medium kinematics is considered under the multiplicative decomposition of the total deformation gradient. The constitutive equations are deduced using the theory of flow and the second law of thermodynamics. As a result, we find the dependence of the stress tensor rate on the free energy function and on the yield function.

http://dx.doi.org/10.1134/S1995080216060032

Keywords

finite strains, nonlinear elasticity, plasticity